CLAIMS:

1. A method of recovering a clock signal for a TDM output from packets of TDM data which have been transmitted over a packet network, from a source having a source TDM clock to a destination having a destination TDM clock, the method comprising:

providing at least some packets with a Remote Timestamp, or information from which a Remote Timestamp can be generated, representing the state of the source TDM clock when the packet is created;

providing said at least some packets with a Local Timestamp representing the state of the destination TDM clock when the packet is received;

determining a Transit Time value representing the difference between said Local and Remote Timestamps; and

controlling the clock frequency of the TDM output on the basis of said Transit Time as determined above.

2. A method as claimed in claim 1, wherein said Timestamps are based on bit counts at the source and destination TDM clocks.

3. A method as claimed in claim 1, wherein a filter is provided to filter said Transit Time value over time.

4. A method as claimed in claim 3, wherein said filter is a first order low pass filter.

5. A method as claimed in claim 1, wherein any transit time greater than a pre-determined value is excluded as an input to any control algorithm for adjusting the clock frequency of said TDM output

6. A method as claimed in claim 1, wherein received packets are placed in a packet buffer, and the buffer depth is controlled by a depth control algorithm.

7. A method as claimed in claim 6, wherein said depth control algorithm makes adjustments to said packet buffer by adding or removing packets.

8. A method as claimed in claim 1, wherein said Remote Timestamp is calculated at said destination by counting the number of packet payload bits which have been received.

9. A method as claimed in claim 1, wherein a sequence number is allocated sequentially to each packet, and wherein said Remote Timestamp is calculated at said destination by multiplying the packet payload size by the packet sequence number.

10. A method as claimed in claim 1, wherein said clock frequency is controlled by a clock control algorithm which ensures that the change in said clock frequency is proportional to the change in the average transit time.

11. A method as claimed in claim 10, wherein said clock control algorithm is given by:

$$F(m) = F(m-1) + \beta\ (\Delta\Phi_{av}(m) / \Delta t)$$

Where:

$F(m)$ is the Frequency to be written to the DCO;

$F(m-1)$ is the Current DCO Frequency;

β is a constant that determines a time constant;

$\Delta\Phi_{av}(m)$ is the change in the average transit time;

m is the sample number that increments each time the Clock Control Algorithm reads the value of $\Delta\Phi_{av}$; and

Δt is the time interval between reads of values by the Clock Control Algorithm.

12. A method as claimed in claim 10, wherein said clock control algorithm also incorporates phase locking between the source and destination TDM clocks.

13. A method as claimed in claim 12, wherein said clock control algorithm is given by:

$$F(m) = F(m-1) + \beta\,(\Delta\Phi_{av}(m) / \Delta t) + \gamma\,((\Phi_{av}(m) - K) / \Delta t)$$

Where:

$F(m)$ is the Frequency to be written to the DCO;

$F(m-1)$ is the Current DCO Frequency;

$\Delta\Phi_{av}(m)$ is the change in the average transit time;

m is the sample number that increments each time the Clock Control Algorithm reads the value of $\Delta\Phi_{av}$;

β and γ are constants that determine time constants of the algorithm;

K is a constant that provides a "centre value" for the filtered transit time, $\Phi_{av}(m)$; and

Δt is the time interval between reads of values by the Clock Control Algorithm.

14. A clock recovery system for recovering a clock signal for a TDM output from packets of TDM data which have been transmitted over a packet network, from a source having a source TDM clock to a destination having a destination TDM clock, the system comprising:

remote timestamp extraction means for extracting a Remote Timestamp value from received packets, the Remote Timestamp representing the state of the source TDM clock when the packet is created;

local timestamp means for providing received packets with a Local Timestamp representing the state of the destination TDM clock when the packet is received;

a differencer for determining a Transit Time representing the difference between said Local and Remote Timestamps; and

clock control means arranged to control the frequency of the TDM output on the basis of said Transit Time.

15. A clock recovery system as claimed in claim 14, wherein said Timestamps are based on bit counts at the source and destination TDM clocks.

16. A clock recovery system as claimed in claim 14, which further comprises a filter for filtering the output of said differencer.

17. A clock recovery system as claimed in claim 16, wherein said filter is a first order low pass filter.

18. A clock recovery system as claimed in claim 14, which further comprises a packet buffer for holding received packets, and a depth control arrangement for controlling the depth of the packet buffer.

19. A clock recovery system as claimed in claim 18, wherein said depth control arrangement is arranged to make adjustments to said packet buffer by adding or removing packets.

20. A clock recovery system as claimed in claim 14, wherein said remote timestamp extraction means calculates said Remote Timestamp by counting the number of packet payload bits which have been received.

21. A clock recovery system as claimed in claim 14, wherein a sequence number is allocated sequentially to each packet, and wherein said Remote Timestamp is calculated at said destination by multiplying the packet payload size by the packet sequence number.

22. A clock recovery system as claimed in claim 14, wherein said clock control means ignores any Transit Time greater than a predetermined value.